



National
Operational
Guidance

Guidance

Environmental protection



NFCC
National Fire
Chiefs Council

Developed and maintained by the NFCC



Contents

- Introduction 4
 - Environmental responsibilities* 4
 - Environmental legislation* 5
 - Responsibility of fire and rescue services* 7
 - Fire and rescue service legislation* 7
 - Risk management planning* 8
 - Working with environment agencies* 8
 - Motorway and highway drainage* 10
 - Environmental risk assessment* 11
- Hazard - Fire water run-off 12
 - Control measure - Controlled burning* 12
 - Control measure - Containment* 16
 - Control measure - Recycling* 20
 - Control measure - Reduction* 22
 - Control measure - Disposal* 23
 - Control measure - Operational risk information plan* 25
- Hazard - Firefighting with foam 26
 - Control measure - Containment (Foam)* 26
 - Control measure - Substitution* 28
 - Control measure - Reduction* 28
 - Control measure - Disposal* 29
 - Control measure - Operational risk information plan* 31
- Hazard - Smoke plumes 32
 - Control measure - Controlled burning* 32
 - Control measure - Extinguish* 36
 - Control measure - Removal or separation* 37
 - Control measure - Air quality cell function* 38
 - Control measure - Operational risk information plan* 39
- Hazard - Polluting materials 40
 - Control measure - Access to specialist advice* 41
 - Control measure - Containment* 42
 - Control measure - Dilution* 47
 - Control measure - Absorption* 48
 - Control measure - Transportation* 49
 - Control measure - Aeration* 50



<i>Control measure - Treatment</i>	51
<i>Control measure - Disposal</i>	52
<i>Control measure - Decontamination</i>	54
Hazard - Physical damage to the environment	55
<i>Control measure - Defined paths and tracks</i>	55
<i>Control measure - Liaison with conservation bodies</i>	56
<i>Control measure - Operational risk information plan (Nature conservation sites)</i>	57
Hazard - Leaks from high pressure oil pipelines	58
<i>Control measure - Containment</i>	59
<i>Control measure - Diversion</i>	63
<i>Control measure - Operational risk information plan</i>	64



Introduction

At an incident, the highest priority for fire and rescue services will always be the safety of the public and firefighters. But they must also take into account the potential damage to the environment caused by the incident itself or fire and rescue service actions, both of which can affect air, land and water.

Effective and informed action by responders can reduce the environmental impact of incidents and protect public safety. This section of National Operational Guidance sets out the knowledge and controls that should be considered to protect the environment. It does not give information on the specific risks from hazardous materials, which can be found in National Operational Guidance: [Hazardous Materials](#) and the Department for Communities and Local Government's hazardous materials guidance.

This piece of guidance contains a number of references to the Environment Agency's [Environmental Protection Handbook](#) for the Fire and Rescue Service, jointly produced by the Environment Agency, fire and rescue services and the [Department for Communities and Local Government](#).

The structure of this guidance follows the style and format of fire and rescue service National Operational Guidance Programme. It relates to specific hazard and control measures following a literature review. The control statements support a fire and rescue service in developing policies and procedures that deliver the 'safe person' principles and promote the protection of the environment at all incidents.



Environmental responsibilities

Responsibility for protecting the environment in the UK rests with a number of different organisations at central and local government levels.

The most significant of these are the four UK environment agencies: the [Environment Agency](#) in England, [Natural Resources Wales](#), the [Scottish Environment Protection Agency](#) and the [Northern Ireland Environment Agency](#). Each has similar duties and powers to protect and improve the environment, although there are some differences in responsibilities between them, for example in flood risk management, fisheries, and controlling industrial discharges and emissions. The term

'environment agencies' is used in this guidance to refer to these four organisations.

Nature conservation bodies are the enforcing authority for open land such as sites of special scientific interest (SSSI), specific areas of conservation and special protection areas. These bodies include [Natural England](#), [Scottish Natural Heritage](#), [Natural Resources Wales](#) and the [Northern Ireland Environment Agency](#).

The Maritime and Coastguard Agency is responsible for pollution from shipping and offshore installations such as oil rigs. The Secretary of State has a power to extend marine responsibilities when it is considered to be in the national interest. See Section 1.8.2, [Environmental Protection Handbook](#).

Local authorities have environmental responsibilities including the impact of smoke from a fire and from vehicle emissions. They deal with complaints related to noise, litter and odour for sites not regulated by environmental agencies and most fly tipping incidents. See Section 1.3.5, [Environmental Protection Handbook](#).

Environmental legislation

The Environmental Permitting (England and Wales) Regulations 2010 (EPR 2010)

Under the [regulations](#), it is an offence to cause or knowingly permit the release of pollution to ground or surface waters. This is unless the release is allowed by [an environmental permit](#) or exemption.

To cause must involve an active operation or the failure to take action. To knowingly permit involves the failure to prevent pollution where there is knowledge of it occurring.

The regulations do allow a defence where fire and rescue service actions cause pollution, but the following three criteria must all be met:

- A discharge is made in an emergency to avoid danger to human health
- All reasonably practicable steps were taken to minimise pollution
- The relevant environment agency is informed of the incident as soon as possible

See Section 1.4, [Environmental Protection Handbook](#).

[Environmental Damage \(Prevention and Remediation\) \(England\) Regulations 2015](#),

[Environmental Damage \(Prevention and Remediation\) Regulations 2009 in Scotland, Wales and](#)

Northern Ireland

Under the regulations, fire and rescue services must take steps to prevent or reduce environmental damage. They must notify the appropriate regulator of:

- Damage to a site of special scientific interest
- Damage to species and habitats outside SSSIs that are protected by EU legislation
- Serious long-term damage to ground or surface water (that results in a decline in water status under the Water Framework Directive)
- Contamination of land by substances or organisms that cause significant risk to human health

In normal circumstances there is no defence against a breach of the regulations. However, there is a defence in exceptional circumstances. See Section 1.4.6, [Environmental Protection Handbook](#).

The regulator may require fire and rescue services to carry out preventive and remediation measures. It may also be necessary to pay costs for any environmental damage caused. For protected sites and species, a fire and rescue service may be liable if damage is deliberate or is caused by negligence.

Water Industry Act 1999

It is an offence to release polluting material into a sewer without having consent from the sewerage company. Sewerage companies must be informed when accidental releases occur. See Section 1.6.4, [Environmental Protection Handbook](#).

Other relevant legislation

England and Wales:

- The [Hazardous Waste Regulations 2005](#) (as amended)
- [The Waste \(England and Wales\) Regulations 2011](#)

Scotland:

- [Water Environment \(controlled Activities\) \(Scotland\) Regulations 2011](#)
- [Sewerage \(Scotland\) Act 1968 as amended](#)
- [The Special Waste Regulations 1996, as amended](#)
- [Environmental Liability \(Scotland\) Regulations 2009](#)

Northern Ireland:

- [The Water \(Northern Ireland\) Order 1999](#)
- [The Waste and Sewerage Services \(NI\) Order 2006](#)

- [The Groundwater Regulations \(Northern Ireland\) 2009](#)
- [The Environmental Liability \(Prevention and Remediation Regulations \(Northern Ireland\) 2009](#)



Responsibility of fire and rescue services

Fire and rescue services are responsible, under legislation and regulations, for developing policies and procedures and to provide information, instruction, training and supervision to their personnel about foreseeable hazards and the control measures used to reduce the risks arising from those hazards.

This guidance sets out to provide fire and rescue services with sufficient knowledge about the potential hazards their personnel could encounter when attending incidents. Fire and rescue services should ensure their policies, procedures and training cover all of the hazards and control measures contained within this guidance.



Fire and rescue service legislation

In addition to their responsibilities under the [Fire and Rescue Services Act 2004](#), fire and rescue services must be aware of their responsibilities under other relevant legislation which consider the environment.

The Fire and Rescue Services (Emergencies) (England) Order 2007

The Order places a duty on fire and rescue services (in England) to have the capability to remove chemical, biological, radiological, nuclear and explosive contaminants from people at an emergency. There is also a duty to contain water used for decontamination for a reasonable time. Fire and rescue services must take steps to prevent or limit environmental damage when decontaminating people.

The [Fire \(Additional Function\) \(Scotland\) Order 2005](#) places a similar duty on the Scottish Fire and Rescue Service, as does the [Fire and Rescue Services \(Emergencies\) \(Wales\) Order 2007](#) in Wales. See Section 1.6.6, [Environmental Protection Handbook](#).

Civil Contingencies Act 2004

As Category 1 responders, fire and rescue services are part of the multi-agency response to civil emergencies. The role of the fire and rescue service under the act is to save life, and to protect property and the environment. To be an 'environmental emergency' an incident must be one of the following:

- Contamination of land, water or air with a harmful biological, chemical or radioactive substance
- Flooding
- Disruption or destruction to plant life or animal life

Risk management planning

Fire and rescue service integrated risk management plans should consider environmental risk. They should identify and assess

- Potential pollution sources
- The sensitivity and vulnerability of the local environment.

Factors to consider include:

- Impact on:
 - Public and private water abstraction points
 - Aquifers
 - Bathing water, fisheries and other recreational uses of water
 - Nature conservation sites, such as SSSIs
 - Other uses of water, for example, agriculture
 - Pathways the pollutant will follow using drainage plans and control options, such as the type and location of pollution prevention systems

A basic understanding of environmental science will help fire and rescue services prioritise environmental protection work and help them to incorporate environmental risk into risk management planning and site specific risk plans. See Section 1.2, [Environmental Protection Handbook](#).

A template has been prepared to complete an [environmental risk assessment](#).



Working with environment agencies

Partnerships between environment agencies and fire and rescue services are a key part of any strategy to control pollution. This approach is underpinned by national working agreements (memorandums of understanding) and local working agreements.

The main responsibilities of the environment agencies are:

- Managing water resources used for public and private water supplies
- Preventing and controlling pollution in inland waters, estuaries and coastal waters (to a distance of three miles)
- Protecting people and the built environment from flooding
- Regulating emissions and operations at large or complex industrial sites
- Setting consistent standards for treating, storing and moving waste
- Regulating the disposal of radioactive waste from nuclear licensed sites
- Regulating the keeping and use of radioactive materials on sites other than licensed sites

See Section 1.3, [Environmental Protection Handbook](#).

Communicating with environment agencies

Fire and rescue services must have systems to advise environment agencies when there is potential for pollution, or when pollution has occurred. This includes pollution from fire and rescue service actions. There is no legal defence where pollution is caused by a fire and rescue service in non-emergency situations.

When informed of an incident, environment agencies will first provide help by telephone. A competent agency officer will assess how serious the incident is and decide on the response. The environment agencies classify environmental impacts into four categories:

- Category 1: Most serious and damaging
- Category 2: Significant damage and impact
- Category 3: Pollution confirmed - local impact
- Category 4: Event reported but no damage can be confirmed

Environment agencies will, as soon as is reasonably practicable attend incidents:

- Where there is or may be a significant environmental impact
- Where a fire and rescue service reasonably requests its attendance

If the environment agency decides attendance is not appropriate it will advise the fire and rescue

service of its decision and will provide information to incident commanders over the phone if requested. See Section 3.1, [Environmental Protection Handbook](#).

Scene protocols

The attending environment agency officer will assess the scene, offer advice or where appropriate, under the knowledge and supervision of the fire and rescue service incident commander, take action to prevent or limit pollution.

Environment agencies' officers take the following roles:

- Competent officer: the officer receiving initial details of the incident and determining the response
- Site controller: responsible for co-ordinating the environmental response at the scene
- Base controller: an experienced member of staff responsible for overall incident control

For smaller incidents the same person may perform more than one role.

Environment agencies may also take direct action to control pollution themselves if there is an immediate threat to the environment and the polluter cannot be found or is unable or unwilling to act. See Section 3.6, [Environmental Protection Handbook](#).



Motorway and highway drainage

The overall responsibility for managing motorways and trunk roads lies with the relevant highways agency. Some roads are managed by private companies, and other 'A' roads and all minor roads are managed by local authorities.

There are three major objectives in road drainage:

- To remove surface water quickly to provide safe roads and minimum nuisance
- To provide effective drainage to maximise the life of the road
- To minimise the impact of run-off on the receiving environment

Road drainage can be broadly classified into two elements: surface and sub-surface. These two elements are not completely separate from one another.

Because it is important that water drains quickly from the road surface, it can be difficult to contain polluted run-off from an incident before it enters a local water body.

The highways agencies have access to a wide knowledge base of the area along the national road network, including the location and operation of pollution control devices. They will also be able to call on additional environmental protection equipment and resources from their own incident support units.

Storage bins containing pollution control materials are located near many motorway slip roads. The Storage bins are kept locked and keys are held by environment agency and highways agency traffic officers. See Section 1.7, [Environmental Protection Handbook](#) for further information.

A reduced level of pollution control and response exists for locally maintained road infrastructure, and in most cases local authorities can be contacted to obtain pollution control information.



Environmental risk assessment

Incident commanders should conduct an assessment of the environmental risk at incidents they attend. This will help them to identify the potential risks posed by fire service actions on the environment and the control measures, which can be applied to reduce or, where possible, prevent environmental damage.

An environmental risk assessment should identify:

- Nearby population
- Livestock
- Location of local watercourses
- Location of SSSI/sensitive habitats and their proximity to the incident
- Incident location in relation to sensitive groundwater.
- Local drainage
- Polluting materials
- Type of media being used
- Quantity of firewater run-off being produced
- Volume/properties of any spilt materials
- Weather conditions

A [template](#) has been prepared to complete an environmental risk assessment. For smaller incidents the [environmental risk assessment](#) may be included as part of the [dynamic risk assessment](#).

For larger, more protracted incidents or where a known risk to the environment has been identified, a formal [environmental analytical risk assessment](#) should be completed and recorded.



Any risk to the environment either known or suspected should be communicated to those attending the incident and where appropriate, the relevant agencies. Information on environmental risk assessment is contained in Section 3.4 of the [Environmental Protection Handbook](#).

Source-Pathway-Receptor model

Pollution control should be carried out using a Source-Pathway-Receptor model. The first action is to identify any hazards to the environment (the source). When a hazard is identified, measures should be taken to prevent or reduce the risk of pollutants reaching (via a pathway) vulnerable parts of the environment (the receptor). For example, contaminated fire water (the source) could travel via surface drains (the pathway) into a local watercourse (the receptor).



Hazard - Fire water run-off

Hazard Knowledge

During incidents, contaminated fire water can affect the environment through direct run-off into a water body, soaking away into the ground or by entering drainage systems. These systems may then transport pollutants in the firewater into rivers, lakes, estuaries and the sea, groundwater, or to sewage treatment works. Introducing a heated liquid into a watercourse is also a form of pollution because it may cause de-oxygenation or kill aquatic organisms. See Section 1.6, [Environmental Protection Handbook](#).



Control measure - Controlled burning

Control measure knowledge

Controlled burning is a defensive operational tactic to prohibit or restrict the use of extinguishing media on fires to allow the combustion process to continue uninhibited. UK law does not require fire and rescue services to extinguish fires. A controlled burning strategy may warrant consideration in certain circumstances, including protecting the environment, where the benefit from offensive firefighting does not outweigh the risks, or where available resources and media are insufficient to successfully resolve the incident.

This operational strategy can be employed to limit damage to the environment when it is not possible to contain polluted fire water, as it can minimise the risk to public drinking water supplies from fire water runoff. It may also benefit air quality through improved combustion and dispersion of airborne pollutants. It can be employed in conjunction with firebreaks as a firefighting technique when responding to fires in areas such as moorlands or heathlands.

It is essential to understand that this strategy may have adverse effects, such as hazardous gaseous by-products to form or increase. The balance of potential water and airborne impacts is one of the factors that should be taken into account before implementing the strategy. See Section 3.7, [Environmental Protection Handbook](#).

Controlled burn considered

Life or health is not at risk or a controlled burn will reduce risk to people

There is little chance of extinguishing the fire

Fighting the fire with other techniques could cause a significant risk to firefighters

Property is beyond salvage

Controlled burn likely to be inappropriate

Life or health is at immediate risk or a controlled burn will increase risk to people

There is a high chance of extinguishing the fire with minimal health or environmental impacts

The fire is likely to spread widely or to high-hazard areas

Important or valuable buildings are involved



Fire conditions, weather conditions and/or the local landscape are appropriate for minimising air quality impacts

Fire water run-off could damage an area of high environmental sensitivity or value

Fire water run-off could affect drinking water sources or sewage treatment works

Fire conditions, weather conditions and/or the local landscape are inappropriate

Drainage from the site leads to an area of low environmental sensitivity or fire water is not polluting

Fire water can be contained on-site or off-site

Incident commanders will decide whether to allow a controlled burn. Wherever possible, they should take specialist advice from hazardous materials advisers (HMA), environment agency staff, owners/occupiers and public health bodies. The decision should be communicated as appropriate, including to the public via the media if necessary.

A controlled burn strategy may be considered at any time during an incident. At incidents where it is expected that the fire will burn for some time it may be appropriate to use both controlled burn and extinguishing tactics. For example, using a controlled burn in the initial stages of an intense fire may result in lower concentrations and better dispersion of pollutants because of the high combustion temperatures as well as reduced run-off.

The technique of introducing an accelerated control burn, which may include the use of fire service positive pressure ventilation fans (PPV), can help to increase temperature and therefore decrease the combustion time.

However, with both controlled burn and an accelerated controlled burn, as the fire dies back and begins to smoulder, the pollutant levels in the smoke plume may increase, resulting in reduced dispersion of pollutants and lowering of the smoke plume and contents in the atmosphere. At this point an extinguish strategy could be used. Such a strategy would also give more time for fire water containment measures to be put in place.

Controlled burn strategies may apply to industrial or commercial premises processing or storing polluting substances but can also be useful to limit the effects of fires involving:

- Agricultural premises, for example barns or [BASIS \(Registration\) Ltd](#) stores
- Transport by road, rail, air or sea or hazardous and/or environmentally damaging materials in significant quantities

For sites falling under the [Control of Major Accident Hazard Regulations 1999](#) (COMAH), [The Environmental Permitting \(England and Wales\) Regulations 2010](#) and other relevant environmental

legislation, fire and rescue services should liaise with site occupiers and environment agencies to establish situations where considering a controlled burn may be required as part of:

- An industry protection scheme such as the BASIS (Registration) Ltd scheme for agrochemical stores
- An incident response plan at a site regulated by environment agencies
- An environmental management system or as part of the risk management plan as an agreed environmentally best option

Certain buildings have a particularly high value, not just in rebuilding costs but also because of their architectural, cultural, historical or strategic significance. Although it is unlikely that a building of this type would be used to store significant quantities of hazardous or polluting substances, the health and environmental benefits of a controlled burn must be weighed against the value of the building when they do.

The decision to adopt a controlled burn strategy should be made following consultation with relevant agencies, for example:

- Environmental agencies
- Nature conservation bodies
- Public health organisations
- Local authority
- Highway agencies

See also: National Operational Guidance: [Environmental protection](#)

Strategic actions

Fire and rescue services should:

- Develop tactical guidance and support arrangements for the hazards that may be encountered and the actions to be taken for controlled burning
- Ensure that a controlled burn strategy takes into account both the event and post-event phase of an incident
- Make appropriate arrangements for mitigating pollution and informing the relevant environmental agency and, where necessary, the local population. Liaise with the appropriate agencies to establish air and water monitoring arrangements, both on and off site where necessary
- Identify pre-determined sites where a controlled burn strategy may be appropriate

Tactical actions

Incident commanders should:

- Consider a controlled burn strategy and communicate this to personnel and relevant authorities



Control measure - Containment

Control measure knowledge

The principle of containment whenever practicable and safe to do so is the preferred approach to managing incidents where polluting liquids or materials have been released or generated by on-site activities, including firefighting.

This hierarchy should be used in most instances when containing contaminated fire water run-off and spillages of polluting materials:

Hierarchy	Activity	Description
1	Containment at source	The most effective intervention point is where the source of pollution can be controlled to stop or reduce the volume released. Methods include the use of clay seal putty, leak sealing devices, wedges, and drums. Contaminated fire water will ideally be contained at an incident scene either inside the building or as close to it as possible.
2	Containment close to source	The next point of intervention is as close to the source as possible. This may be when it is not possible to contain at source or where there has already been significant loss of pollutant. Methods include the use of grab packs, booms and pop-up pools.

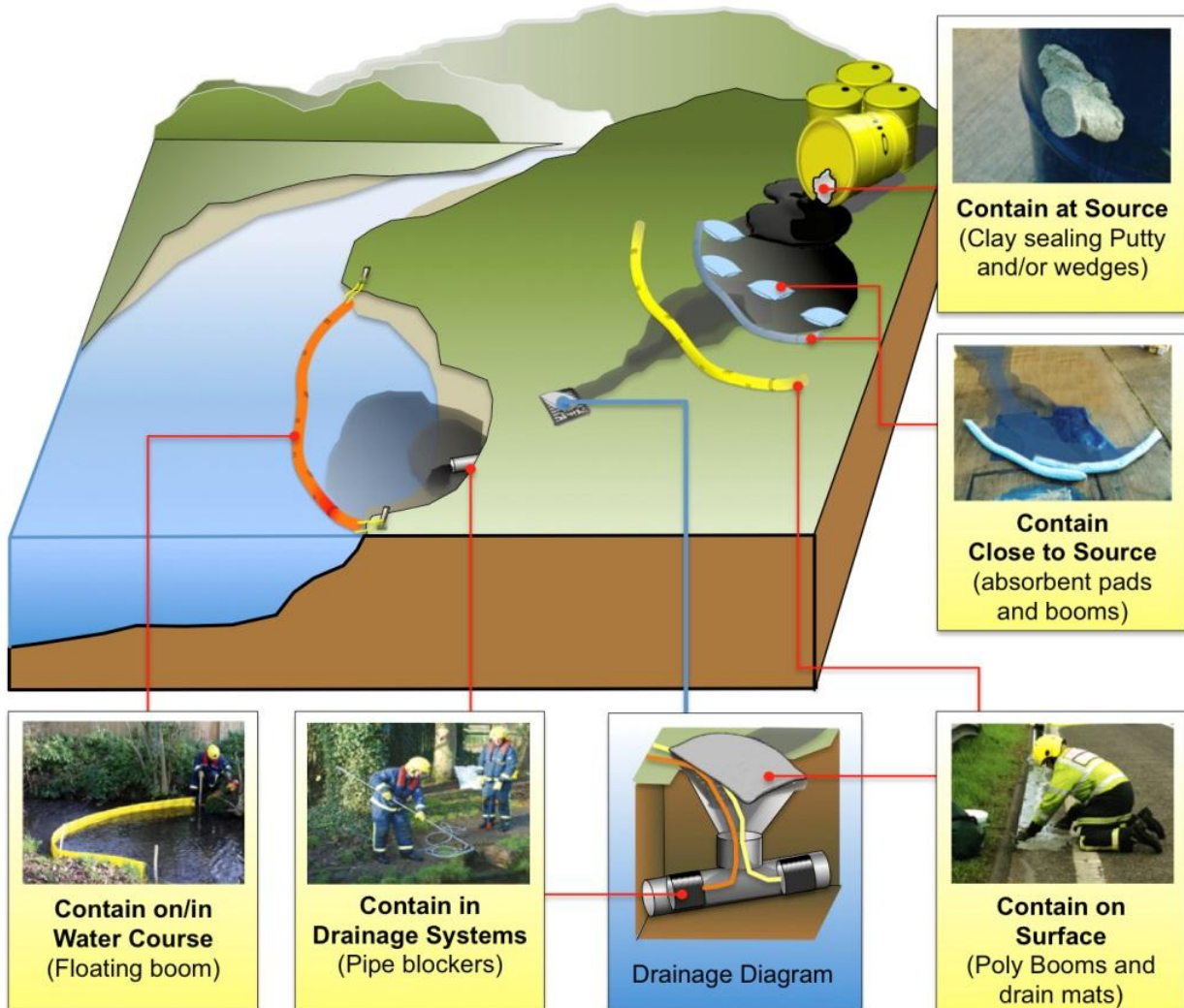


- | | | |
|---|----------------------------------|--|
| 3 | Containment on the surface | The most common way for contaminants to enter the environment is via drainage systems. Methods to prevent this include the use of booms, clay drain mats, pipe blockers, pumps, and inflatable dams. |
| 4 | Containment in drainage system | Pollutants may be contained in drainage systems if they have already entered the system. This can be carried out using in-built pollution control devices in the drainage systems such as oil separators, drain closure valves and containment lagoons/tanks and ponds. Such a system should allow predictable volumes of run-off to be stored, although allowance should be made for rainfall and how well systems have been maintained. Portable equipment such as pipe blockers can also be used. |
| 5 | Containment on or in watercourse | The deployment of booms on a watercourse downstream of an incident is of significant benefit where a pollutant floats. Damming can be used where pollutants are mixed or do not float but is normally restricted to small ditches and streams with low flows. Booms can also be deployed around drinking water intakes. |

See Section 3.2, [Environmental Protection Handbook](#).



Pollution Hierarchy



Off-site containment is an alternative that can be considered by fire and rescue services. Foul sewerage systems can be used to contain polluting material if approved by the sewerage company and environment agency. When doing so take care that pollutants and sewage do not escape from any storm overflows into the sewerage system. The contained pollutants and sewage may then be removed.

It may also be possible to divert pollutants to a local sewage treatment works, where the pollutant can either be treated in the treatment process or contained in storm tanks before deciding on disposal. These tanks are present at many treatment works and are used to store the large volumes of diluted sewage produced during high rainfall. Approval from the sewerage company must be sought before diverting pollutants to a sewage treatment works because the treatment process can be affected if levels of pollution are too high. This would result in the release of both



pollutants and untreated or partially treated sewage. See Section 1.66, [Environmental Protection Handbook](#).

Pollution control devices such as drain closure valves, storage lagoons or balancing ponds are installed in some surface water drainage systems. These devices can be used to help contain pollutants if permission is given by the sewerage company, the owner/occupier or highway authority. In some places the environment agencies keep large volume pumps that can be used to support, supplement or replace fire and rescue service pumps.

Unless there is an immediate risk to life, containment measures can be used and advice and guidance from environment agencies should be sought before making any attempt to dilute. Never add detergent or any other cleaning products to spillages and never hose spillages to the drain without prior authority from the environment agencies and/or sewerage undertakers.

For further information see the [Environmental Protection Handbook](#).

Strategic actions

Fire and rescue services should:

- Develop procedures for containing fire water run-off
- Obtain sewerage information from local sewerage undertaker
- Consider the inclusion of drainage information in operational risk plans. See National Operational Guidance: [Operations](#)

Tactical actions

Incident commanders should:

- Minimise the impact of the incident and fire service actions on any identified environmental risk
- Consider the legal exemptions in relation to environmental protection i.e.
 - A discharge is made in an emergency to avoid danger to human health
 - All reasonably practicable steps were taken to minimise pollution
 - The relevant environment agency is informed of the incident as soon as possible
- Consider carrying out an [environmental risk assessment](#) to identify:
 - Site drainage



- local surface waters and/or groundwater and vulnerability
- Attempt to control pollution using a Source – Pathway - Receptor model
- Consider the availability of pollution control equipment and/or pollution containment facilities on site
- Establish the location of the nearest sewage treatment works, and whether it has the capacity to contain and or treat fire water run-off?
- Inform and/or seek advice from environment agencies and/or sewage undertakers where necessary
- Consider diverting water to holding areas or sacrificial areas that will not affect firefighting operations
- Identify potential drainage routes for fire water run-off and released vehicle content
- Consider future disposal options. Refer to section [Disposal](#)
- Identify the location of motorway pollution control devices (PCD) and operate as necessary
- Communicate any risk to the environment to those attending the incident and relevant agencies



Control measure - Recycling

Control measure knowledge

Pumps can be used to recycle fire water at an incident. It is important that the act of recycling water does not make the situation worse. Consistent recycling of fire water run-off will increase the concentration of pollution, and the risk of spreading pathogens within recycled water spray.

Incident commanders should make sure that the recirculated fire water is not harmful to either to personnel attending the incident or the local population.

Recycling water from mixed waste (household waste containing organic material, often nappies and food) should be avoided. For all other recycling sites (wood, plastic etc.) recycling the fire water run-off along with other tactics i.e. controlled burn presents a viable option to reducing damage to the environment.

Disposal of used recycled fire water may also present a problem for the fire service towards the end of an incident. Advice on continued use of recycled fire water run-off and its use and disposal of should be obtained from the:

- Relevant environment agency
- Public health body
- Tactical adviser
- Hazardous materials adviser

For further information see Section 3.2.8 [Environmental Protection Handbook](#).

Strategic actions

Fire and rescue services should:

- Have procedures for recycling fire water run-off
- Where appropriate, have procedures for testing pollutants in recycled fire water run-off. This maybe undertaken by:
 - Relevant environment agencies (biological and chemical sampling)
 - Sewage undertakers
 - Public health bodies
 - Alternative supplier/laboratories
 - Tactical advisers
 - Hazardous materials advisers/technical support teams

Tactical actions

Incident commanders should:

- Identify and assess the impact of the material on fire before the decision to recycle fire water run-off is made



- Consider the possibility of responders and the local population inhaling pollutants within recycled water vapour, based on their location and distance from the fire
- Carry out an environmental risk assessment and monitor the impact of tactics on the identified risk
- Consider the possible recirculation of fire water run-off, to reduce water used
- Consider the use of smooth bore branches to avoid blockages
- Recognise the potential contamination of equipment and PPE. See [National Operational Guidance: Operations](#)
- Consider hygiene. See [National Operational Guidance: Operations](#)
- Use false bottom dams or pools (made of plastic trays), containment tanks or lagoons to reduce the possibility of blockages from particles contained within water run-off
- Reduce the level of pollutants and debris in the firewater by replacing a proportion of the fire water each time it is recycled with fresh water
- Identify future disposal options. See [Disposal](#)



Control measure - Reduction

Control measure knowledge

The amount of water used can be reduced by using water sprays instead of jets and by using hand-held jets instead of ground monitors. This will reduce the amount of [fire water run-off](#).

Strategic actions

Fire and rescue services should:

- Consider maintaining a stock of hand controlled branches capable of producing a fire fighting jet and/or water spray at reduced levels of flow

Tactical actions

Incident commanders should:

- Consider identifying areas of operation where a reduced use water strategy can be initiated without significantly increasing the risk of fire spread or compromising safety
- Consider the impact of fire water run off on compacted materials and ground conditions
- Consider a controlled burn strategy; see [Controlled burning](#)



Control measure - Disposal

Control measure knowledge

During the early stages of an incident when the fire service activities are more dynamic, it may not always be possible to contain fire water safely. In these circumstances use of the foul sewer should be considered for disposal. The flow rate should be controlled to avoid the foul sewer overflowing. Failure to control the flow could result in polluting water entering the water environment. See [Fire water run-off](#).

At some incidents, the foul sewage system may be the best disposal option. If this is the case, the sewerage company must be contacted. They will consider the request and take account of the likely impact if they do not approve the discharge. Agreement from the appropriate environment agency must be obtained before any release takes place. This can be obtained by telephone but must be applied for and confirmed in writing later. See Section 1.6.6, [Environmental Protection Handbook](#).

For further information see Section 3.10.3 [Environmental Protection Handbook](#): The movement of hazardous waste by the fire and rescue service in emergencies.

For further information see Section 3.2.8 [Environmental Protection Handbook](#).

Strategic actions

Fire and rescue services should:

- Be aware of their legal responsibilities and possible defences for the disposal of fire water under the [Environmental Permitting Regulations 2010](#) and [Environmental Damage \(Prevention and Remediation\) Regulations 2015 \(EDR 2015\)](#)
- Develop plans for the disposal of contaminated fire water run off which include plans for:
 - Use off-site storage within drainage infrastructure e.g. balancing ponds
 - Use of foul water drainage
 - Contingencies for where the responsibility for disposal cannot be identified

Tactical actions

Incident commanders should:

- Ensure that waste products created by the fire and rescue service are disposed of both legally and responsibly. The [Environmental Permitting \(England and Wales\) Regulations 2010 \(EPR 2010\)](#) provides two exceptions for the emergency disposal of contaminated fire water runoff where the primary focus of fire and rescue service actions is saving life:
 - Emergency discharge and subsequent contamination of the water environment
 - The removal of waste by a fire and rescue services using fire and rescue service equipment or vehicles
- Consider the legal exceptions. see [Environmental Legislation](#)
- Ensure that the relevant environment agency is informed of the incident as soon as possible and is be involved in the decision to discharge
- Inform sewerage undertakers if discharge is to foul the water sewerage system
- Identify if the responsibility for disposal of waste produced at an incident can be delegated to a third party based on location, material and quantities involved. Namely:
 - Local authority - Playing fields, public open spaces, beaches and some roads
 - Landowner or owner / occupier - Private property
 - Highways agency - (Road Service in Northern Ireland) - Major roads
- Identify if there are any alternative methods of disposal:

- Suitable site arrangements for a waste disposal
- Tankering away the contaminated water
- Identify potential drainage routes for fire water run-off and released vehicle content
- Ensure that waste products created by the fire and rescue service are disposed of legally and responsibly



Control measure - Operational risk information plan

Control measure knowledge

Operational risk information plans are prepared in accordance with the [Fire and Rescue Services Act 2004](#) and focus on firefighter safety. The plans should also include information on pollution, prevention and control where a risk to the environment is identified at an incident.

For further information see:

- [DCLG operational risk information guidance](#)
- Section 2.2 and 2.3, [Environmental Protection Handbook](#)
- National Operational Guidance: Operations [Identify foreseeable risk](#)
- National Operational Guidance: [Incident Command](#)

Strategic actions

Fire and rescue services should:

- Include environmental risk information within operational risk plans

Tactical actions

Incident commanders should:

- Consider pollution prevention information contained within site specific risk plans

- Carry out an [environmental risk assessment](#)
- Implement the environmental protection measures identified in operational risk information
- Monitor the impact of fire and rescue service tactics on the identified environmental risk
- Identify operation and effectiveness of fixed installations and pollution prevention measures



Hazard - Firefighting with foam

Hazard Knowledge

Firefighting foam causes water pollution. This should not stop fire and rescue services from using foam where there is an operational need. In most cases, preventive action can be taken to limit any impact. Using foam can also have environmental benefits such as reducing water use and extinguishing a fire more quickly.

The main environmental effects of firefighting foams are:

- They can lead to the de-oxygenation of water
- They can be toxic to aquatic life and present risks to drinking water supplies
- Some compounds in them do not break down in the environment and can accumulate in plants and animals

The type of foam used should be appropriate for the task in hand and the minimum quantity used. Using foam is a trigger for notifying environment agencies of an incident. This includes the use of compressed air foam systems. Extra care should be taken when using firefighting foam close to water sources or sensitive environmental areas. Some sites have oil separators in drainage systems. Firefighting foam run-off should not be allowed to enter an oil separator because it will pass through it unaffected and may also flush oil into the drainage system. See Section 3.9, [Environmental Protection Handbook](#).



Control measure - Containment (Foam)

Control measure knowledge

The ability to contain foam run-off is preferable to allowing uncontrolled discharge of foam run-off to drains. Foam containment and run-off are the same as those for fire water run-off. See [Fire water run-off](#).

Strategic actions

Fire and rescue services should:

- Develop foam procedures, which must include:
 - Containment of foam run-off
 - Environmental considerations
- Ensure that the impacts of using foam is included for operations in and around protected sites (for example [Sites of Special Scientific Interest](#))
- Where appropriate, consult with local environment agencies, sewerage companies, and nature conservation bodies where it can be reasonably expected that the use of foam may be considered

Tactical actions

Incident commanders should:

- Make every effort to prevent firefighting foam entering surface and groundwater during an incident
- Consider the availability of pollution control equipment and/or pollution containment facilities on site
- Consider the need to prevent foam run-off entering drains, including during make up activity
- Consider the risk to the environment caused by the use of foam verses the benefits (rapid control of the fire)
- Consider the legal exemptions. See [Environmental legislation](#)

- Consider carrying out an [environmental analytical risk assessment](#)
- Consider informing the following organisations of the use of foam and the quantities involved:
 - Relevant environment agency
 - Sewerage companies (where foam is likely to enter the sewerage system)



Control measure - Substitution

Control measure knowledge

Using foam may have an environmental benefit as fires can be quickly extinguished and fire water run-off is reduced. Consider, too, the type of foam. For example, compressed air foam systems (CAFS) will usually need less concentrate and water to produce adequate foam for fighting. The reduced levels of concentrate and run-off produced are likely to result in run-off being easier to contain, and if it does enter a water body it will have less of an impact.

Strategic actions

Fire and rescue services should:

- Identify where alternative methods of extinguishing fire should be considered within a foam strategy
- When procuring foam concentrate, identify the environmental impact and adjust procedures accordingly

Tactical actions

Incident commanders should:

- Where foam has been applied and there is a significant risk to the environment, evaluate:
 - Alternative types of foam (if available)
 - Using a different extinguishing media
 - High-pressure water fogging systems (if available)
 - Adopting a controlled burn strategy. See [Controlled burn](#)



Control measure - Reduction

Control measure knowledge

The amount of water used can be reduced by using water sprays instead of jets and by using hand-held jets instead of ground monitors. This will reduce the amount of [fire water run-off](#).

Strategic actions

Fire and rescue services should:

- Consider maintaining a stock of hand controlled branches capable of producing a fire fighting jet and/or water spray at reduced levels of flow

Tactical actions

Incident commanders should:

- Consider identifying areas of operation where a reduced use water strategy can be initiated without significantly increasing the risk of fire spread or compromising safety
- Consider the impact of fire water run off on compacted materials and ground conditions
- Consider a controlled burn strategy; see [Controlled burning](#)



Control measure - Disposal

Control measure knowledge

During the early stages of an incident when the fire service activities are more dynamic, it may not always be possible to contain fire water safely. In these circumstances use of the foul sewer should

be considered for disposal. The flow rate should be controlled to avoid the foul sewer overflowing. Failure to control the flow could result in polluting water entering the water environment. See [Fire water run-off](#).

At some incidents, the foul sewage system may be the best disposal option. If this is the case, the sewerage company must be contacted. They will consider the request and take account of the likely impact if they do not approve the discharge. Agreement from the appropriate environment agency must be obtained before any release takes place. This can be obtained by telephone but must be applied for and confirmed in writing later. See Section 1.6.6, [Environmental Protection Handbook](#).

For further information see Section 3.10.3 [Environmental Protection Handbook](#): The movement of hazardous waste by the fire and rescue service in emergencies.

For further information see Section 3.2.8 [Environmental Protection Handbook](#).

Strategic actions

Fire and rescue services should:

- Be aware of their legal responsibilities and possible defences for the disposal of fire water under the [Environmental Permitting Regulations 2010](#) and [Environmental Damage \(Prevention and Remediation\) Regulations 2015 \(EDR 2015\)](#)
- Develop plans for the disposal of contaminated fire water run off which include plans for:
 - Use off-site storage within drainage infrastructure e.g. balancing ponds
 - Use of foul water drainage
 - Contingencies for where the responsibility for disposal cannot be identified

Tactical actions

Incident commanders should:

- Ensure that waste products created by the fire and rescue service are disposed of both legally and responsibly. The [Environmental Permitting \(England and Wales\) Regulations 2010 \(EPR 2010\)](#) provides two exceptions for the emergency disposal of contaminated fire water runoff where the primary focus of fire and rescue service actions is saving life:
 - Emergency discharge and subsequent contamination of the water environment
 - The removal of waste by a fire and rescue services using fire and rescue service



equipment or vehicles

- Consider the legal exceptions. see [Environmental Legislation](#)
- Ensure that the relevant environment agency is informed of the incident as soon as possible and is be involved in the decision to discharge
- Inform sewerage undertakers if discharge is to foul the water sewerage system
- Identify if the responsibility for disposal of waste produced at an incident can be delegated to a third party based on location, material and quantities involved. Namely:
 - Local authority - Playing fields, public open spaces, beaches and some roads
 - Landowner or owner / occupier - Private property
 - Highways agency - (Road Service in Northern Ireland) - Major roads
- Identify if there are any alternative methods of disposal:
 - Suitable site arrangements for a waste disposal
 - Tankering away the contaminated water
- Identify potential drainage routes for fire water run-off and released vehicle content
- Ensure that waste products created by the fire and rescue service are disposed of legally and responsibly



Control measure - Operational risk information plan

Control measure knowledge

Operational risk information plans are prepared in accordance with the [Fire and Rescue Services Act 2004](#) and focus on firefighter safety. The plans should also include information on pollution, prevention and control where a risk to the environment is identified at an incident.

For further information see:

- [DCLG operational risk information guidance](#)
- Section 2.2 and 2.3, [Environmental Protection Handbook](#)

- National Operational Guidance: Operations [Identify foreseeable risk](#)
- National Operational Guidance: [Incident Command](#)

Strategic actions

Fire and rescue services should:

- Include environmental risk information within operational risk plans

Tactical actions

Incident commanders should:

- Consider pollution prevention information contained within site specific risk plans
- Carry out an [environmental risk assessment](#)
- Implement the environmental protection measures identified in operational risk information
- Monitor the impact of fire and rescue service tactics on the identified environmental risk
- Identify operation and effectiveness of fixed installations and pollution prevention measures



Hazard - Smoke plumes

Hazard Knowledge

Incident commanders should take advice from environment agencies, public health bodies and the police at fires that produce large amounts of toxic smoke. This will help them decide whether or not to extinguish the fire based on the environmental and public health implications. If they decide to extinguish the fire then pollution control measures should be used to protect bodies of water from fire water run-off.



Control measure - Controlled burning

Control measure knowledge

Controlled burning is a defensive operational tactic to prohibit or restrict the use of extinguishing media on fires to allow the combustion process to continue uninhibited. UK law does not require fire and rescue services to extinguish fires. A controlled burning strategy may warrant consideration in certain circumstances, including protecting the environment, where the benefit from offensive firefighting does not outweigh the risks, or where available resources and media are insufficient to successfully resolve the incident.

This operational strategy can be employed to limit damage to the environment when it is not possible to contain polluted fire water, as it can minimise the risk to public drinking water supplies from fire water runoff. It may also benefit air quality through improved combustion and dispersion of airborne pollutants. It can be employed in conjunction with firebreaks as a firefighting technique when responding to fires in areas such as moorlands or heathlands.

It is essential to understand that this strategy may have adverse effects, such as hazardous gaseous by-products to form or increase. The balance of potential water and airborne impacts is one of the factors that should be taken into account before implementing the strategy. See Section 3.7, [Environmental Protection Handbook](#).

Controlled burn considered	Controlled burn likely to be inappropriate
Life or health is not at risk or a controlled burn will reduce risk to people	Life or health is at immediate risk or a controlled burn will increase risk to people
There is little chance of extinguishing the fire	There is a high chance of extinguishing the fire with minimal health or environmental impacts
Fighting the fire with other techniques could cause a significant risk to firefighters	The fire is likely to spread widely or to high-hazard areas
Property is beyond salvage	Important or valuable buildings are involved



Fire conditions, weather conditions and/or the local landscape are appropriate for minimising air quality impacts

Fire conditions, weather conditions and/or the local landscape are inappropriate

Fire water run-off could damage an area of high environmental sensitivity or value

Drainage from the site leads to an area of low environmental sensitivity or fire water is not polluting

Fire water run-off could affect drinking water sources or sewage treatment works

Fire water can be contained on-site or off-site

Incident commanders will decide whether to allow a controlled burn. Wherever possible, they should take specialist advice from hazardous materials advisers (HMA), environment agency staff, owners/occupiers and public health bodies. The decision should be communicated as appropriate, including to the public via the media if necessary.

A controlled burn strategy may be considered at any time during an incident. At incidents where it is expected that the fire will burn for some time it may be appropriate to use both controlled burn and extinguishing tactics. For example, using a controlled burn in the initial stages of an intense fire may result in lower concentrations and better dispersion of pollutants because of the high combustion temperatures as well as reduced run-off.

The technique of introducing an accelerated control burn, which may include the use of fire service positive pressure ventilation fans (PPV), can help to increase temperature and therefore decrease the combustion time.

However, with both controlled burn and an accelerated controlled burn, as the fire dies back and begins to smoulder, the pollutant levels in the smoke plume may increase, resulting in reduced dispersion of pollutants and lowering of the smoke plume and contents in the atmosphere. At this point an extinguish strategy could be used. Such a strategy would also give more time for fire water containment measures to be put in place.

Controlled burn strategies may apply to industrial or commercial premises processing or storing polluting substances but can also be useful to limit the effects of fires involving:

- Agricultural premises, for example barns or [BASIS \(Registration\) Ltd](#) stores
- Transport by road, rail, air or sea or hazardous and/or environmentally damaging materials in significant quantities

For sites falling under the [Control of Major Accident Hazard Regulations 1999](#) (COMAH), [The Environmental Permitting \(England and Wales\) Regulations 2010](#) and other relevant environmental

legislation, fire and rescue services should liaise with site occupiers and environment agencies to establish situations where considering a controlled burn may be required as part of:

- An industry protection scheme such as the BASIS (Registration) Ltd scheme for agrochemical stores
- An incident response plan at a site regulated by environment agencies
- An environmental management system or as part of the risk management plan as an agreed environmentally best option

Certain buildings have a particularly high value, not just in rebuilding costs but also because of their architectural, cultural, historical or strategic significance. Although it is unlikely that a building of this type would be used to store significant quantities of hazardous or polluting substances, the health and environmental benefits of a controlled burn must be weighed against the value of the building when they do.

The decision to adopt a controlled burn strategy should be made following consultation with relevant agencies, for example:

- Environmental agencies
- Nature conservation bodies
- Public health organisations
- Local authority
- Highway agencies

See also: National Operational Guidance: [Environmental protection](#)

Strategic actions

Fire and rescue services should:

- Develop tactical guidance and support arrangements for the hazards that may be encountered and the actions to be taken for controlled burning
- Ensure that a controlled burn strategy takes into account both the event and post-event phase of an incident
- Make appropriate arrangements for mitigating pollution and informing the relevant environmental agency and, where necessary, the local population. Liaise with the appropriate agencies to establish air and water monitoring arrangements, both on and off site where necessary
- Identify pre-determined sites where a controlled burn strategy may be appropriate

Tactical actions

Incident commanders should:

- Consider a controlled burn strategy and communicate this to personnel and relevant authorities



Control measure - Extinguish

Control measure knowledge

Fire service high volume pumps, fixed installation pumps or pumps secured from a third party supplier can be used to provide water for firefighting. When using this type of equipment or when large volumes of water are being pumped, the appropriate environment agency must be informed. As well as containing run-off, care should be taken not to draw too much water because this can threaten water supplies and damage ecosystems.

Strategic actions

Fire and rescue services should:

- Develop procedures that incorporate the use of high volume pumps for incidents that will require large volumes of water to extinguish
- Liaise with local environment agencies, local authorities' statutory resilience forums to identify and formulate plans for sites that are likely to produce significant smoke plumes/require large amounts of water to extinguish if involved in fire. See National Operational Guidance: Operations. [Identify foreseeable risk](#)
- Have procedures in place for the safe decontamination of high volume pumping equipment after use. See the following sections of the [Environmental Protection Handbook](#):
 - 1.6.6 Protocol for disposing of contaminated water and associated wastes at incidents
 - 2.12.1 High volume pump decontamination

Tactical actions

Incident commanders should:

- Seek technical advice - for instance, from a Hazardous Materials Advisor (HMA) or product specialist before deploying a high volume pump
- Complete an [environmental risk assessment](#) before deploying a high volume pump
- Notify the local environment agency each time a high volume pump is used or where large volumes of water are being pumped
- Consider the use of local environment agency pumps for incidents that are likely to be significantly protracted
- Consider the decontamination of high volume pumping equipment after use



Control measure - Removal or separation

Control measure knowledge

Fires at open-air storage sites, particularly those storing combustible waste can create large volumes of smoke and fire water containing a wide range of pollutants. The direct application of water with or without firefighting additives to stacks of burning material is often ineffective and may generate large volumes of smoke and contaminated fire water.

For specific guidance on fires involving waste sites see National Operational Guidance: [Fires in waste sites](#) (including renewable energy facilities).

Strategic actions

Fire and rescue services should:

- Develop operational procedure for incidents involving fires at waste sites

Tactical actions

Incident commanders should:



- Consider the use of firefighting additives such as foam for small waste fires and prevent fire spread. (Note: For larger waste fires, foam may provide rapid 'knock down' but often has minimal long term effects on larger waste fires)
- Consider separating burning material from the fire using heavy plant and extinguishing it with:
 - Water jets
 - In bunded pools
 - Tanks of water
 - Controlled burn
 - Burial with approval of the appropriate environment agency
- Make use of specialist fire and rescue service or on-site environmental protection equipment
- Where possible, recycle the fire water run-off. See Recycling fire water run-off.



Control measure - Air quality cell function

Control measure knowledge

If major chemical air pollution occurs at an incident, the environment agencies and public health bodies will set up an air quality cell. This will include other organisations including the [Meteorological Office](#), [the Health and Safety Laboratory](#) and local authorities.

The air quality cell will co-ordinate air monitoring and will provide air quality information. Public health bodies use this information to provide health advice to responders and the public. See Section 3.8, [Environmental Protection Handbook](#).

Similar arrangements exist in Wales, Northern Ireland and in Scotland, where [Scottish Environment Protection Agency](#) (SEPA) provides air quality monitoring through the [Airborne Hazards Emergency Response](#) (AHER) service.

Strategic actions

Fire and rescue services should:

- Ensure that lines of communication are in place to disseminate information provided by the



air quality cell to incident commanders and other specialist advisers during major incidents or other significant events

Tactical actions

Incident commanders should:

- Implement appropriate control measures on the receipt of air quality information
- Consider requesting an air quality cell
- Monitor and review the potential impact on public health with the assistance of the public health agency



Control measure - Operational risk information plan

Control measure knowledge

Operational risk information plans are prepared in accordance with the [Fire and Rescue Services Act 2004](#) and focus on firefighter safety. The plans should also include information on pollution, prevention and control where a risk to the environment is identified at an incident.

For further information see:

- [DCLG operational risk information guidance](#)
- Section 2.2 and 2.3, [Environmental Protection Handbook](#)
- National Operational Guidance: Operations [Identify foreseeable risk](#)
- National Operational Guidance: [Incident Command](#)

Strategic actions

Fire and rescue services should:

- Include environmental risk information within operational risk plans

Tactical actions

Incident commanders should:

- Consider pollution prevention information contained within site specific risk plans
- Carry out an [environmental risk assessment](#)
- Implement the environmental protection measures identified in operational risk information
- Monitor the impact of fire and rescue service tactics on the identified environmental risk
- Identify operation and effectiveness of fixed installations and pollution prevention measures



Hazard - Polluting materials

Hazard Knowledge

Contaminated and polluting materials will affect the environment during incidents. Operational actions may cause or increase pollution, for example, if fires are extinguished without any precautionary actions being taken to contain run-off.

The following types of polluting materials could result from an incident: See Section 1.2.4, [Environmental Protection Handbook](#) and National Operational Guidance: [Hazardous Materials](#).

Scenario	Examples of polluting materials
Road traffic collisions	Oils, fuel, coolants or other liquids
Spillages of non-hazardous materials	Organic matter such as beer and milk
Spillages of hazardous materials	Corrosive, toxic, and flammable materials
Using first aid equipment	Clinical waste, disposable gloves, bandages



Fires involving environmentally damaging materials

Contaminated fire water run-off, toxic smoke plumes, hazardous wastes/residues

Incidents involving contaminating materials

Biological or radioactive materials

All of these scenarios may result in contaminated personal protective equipment and operational equipment.



Control measure - Access to specialist advice

Control measure knowledge

Seek specialist advice at any incident that could pollute the environment. This could be a hazardous materials adviser or third party expert.

See:

- National Operational Guidance: Incident Command - [Situational Awareness](#)
- National Operational Guidance: Operations - [Reduce exposure](#)
- Delegating environmental protection HEMPAs

Strategic actions

Fire and rescue services should:

- Ensure that fire and rescue service managers who are likely to be in command of an incident involving hazardous materials and/or environmental risk, or are likely to perform the specialist advisory role of hazardous materials advisor (HMA), receive specialist environmental training. This training should place emphasis on larger-scale incidents where there is significant environmental risk
- Consider mobilising or involving a Hazardous Materials Advisor (HMA) for any incident with the potential to pollute the environment, not only those incidents involving hazardous

materials. See section 3.3, [Environmental Protection Handbook](#)

- Identify triggers where the local environment agency should be informed or where advice should be requested
- Secure access to more detailed advice from scientific advisers or from the CHEMSAFE service provided by the National Chemical Emergency Centre (NCEC)

Tactical actions

Incident commanders should:

- Ensure that all appropriate environmental agencies are informed of the incident when required
- Consider the appointment of a HMA (or equivalent) to oversee environmental protection activities
- Consider seeking specialist advice from a HMA on remedial action for spillages and fire water run off
- Request advice from appropriate environmental protection agencies
- Consider specialist advice from:
 - Chemical suppliers whose products are held at the incident site
 - Contracted specialist advice
 - Chemsafe
 - National Chemical Emergency Centre (NCEC)
- Notify the environmental agency if a HVP or large volumes of water are being extracted and used
- Request appropriate environmental protection (EP) resources (e.g. hazmat adviser, EP equipment, pumps)



Control measure - Containment

Control measure knowledge

The principle of containment whenever practicable and safe to do so is the preferred approach to managing incidents where polluting liquids or materials have been released or generated by on-site activities, including firefighting.

This hierarchy should be used in most instances when containing contaminated fire water run-off and spillages of polluting materials:

Hierarchy	Activity	Description
1	Containment at source	The most effective intervention point is where the source of pollution can be controlled to stop or reduce the volume released. Methods include the use of clay seal putty, leak sealing devices, wedges, and drums. Contaminated fire water will ideally be contained at an incident scene either inside the building or as close to it as possible.
2	Containment close to source	The next point of intervention is as close to the source as possible. This may be when it is not possible to contain at source or where there has already been significant loss of pollutant. Methods include the use of grab packs, booms and pop-up pools.
3	Containment on the surface	The most common way for contaminants to enter the environment is via drainage systems. Methods to prevent this include the use of booms, clay drain mats, pipe blockers, pumps, and inflatable dams.

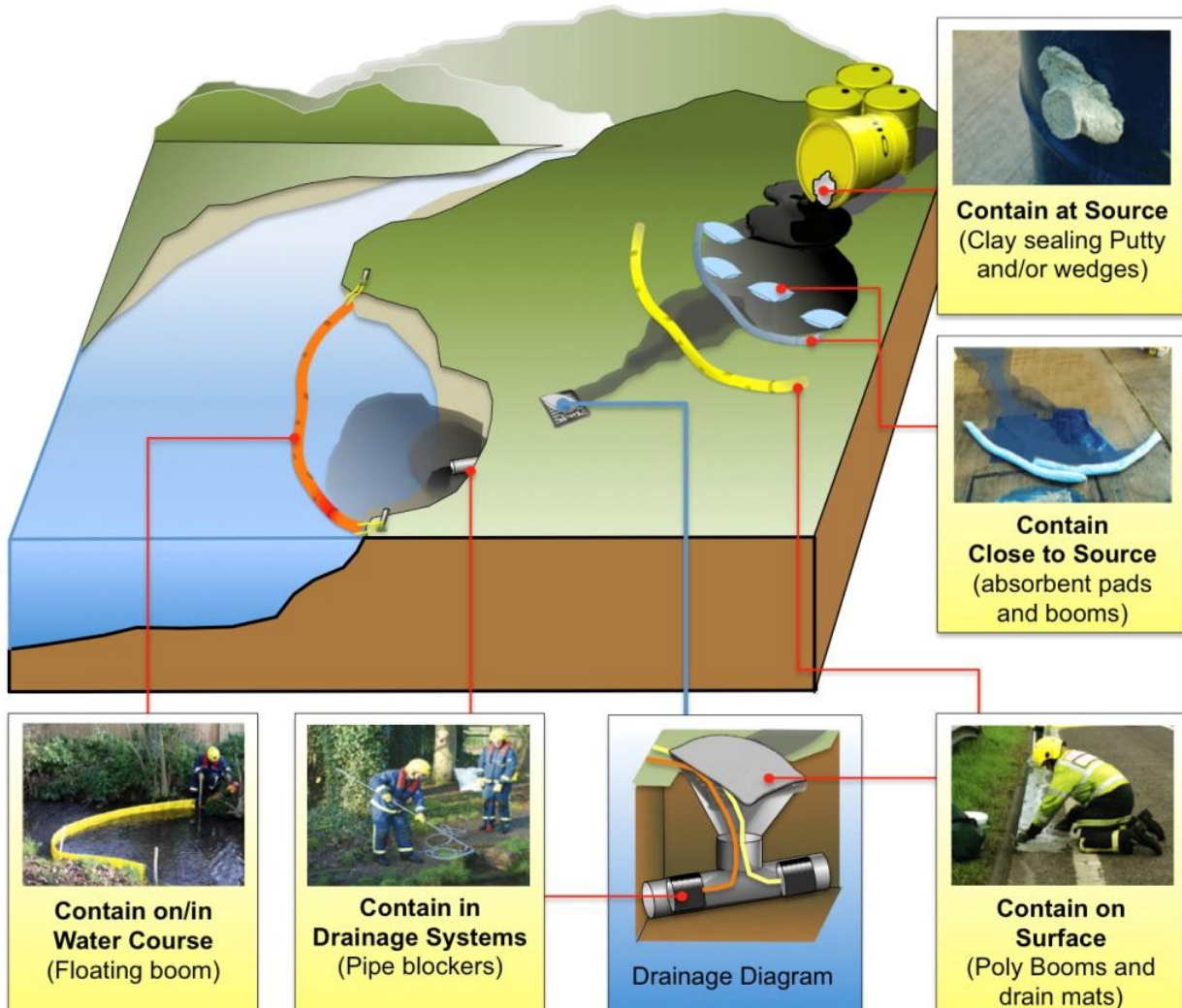


- | | | |
|---|----------------------------------|--|
| 4 | Containment in drainage system | Pollutants may be contained in drainage systems if they have already entered the system. This can be carried out using in-built pollution control devices in the drainage systems such as oil separators, drain closure valves and containment lagoons/tanks and ponds. Such a system should allow predictable volumes of run-off to be stored, although allowance should be made for rainfall and how well systems have been maintained. Portable equipment such as pipe blockers can also be used. |
| 5 | Containment on or in watercourse | The deployment of booms on a watercourse downstream of an incident is of significant benefit where a pollutant floats. Damming can be used where pollutants are mixed or do not float but is normally restricted to small ditches and streams with low flows. Booms can also be deployed around drinking water intakes. |

See Section 3.2, [Environmental Protection Handbook](#).



Pollution Hierarchy



Off-site containment is an alternative that can be considered by fire and rescue services. Foul sewerage systems can be used to contain polluting material if approved by the sewerage company and environment agency. When doing so take care that pollutants and sewage do not escape from any storm overflows into the sewerage system. The contained pollutants and sewage may then be removed.

It may also be possible to divert pollutants to a local sewage treatment works, where the pollutant can either be treated in the treatment process or contained in storm tanks before deciding on disposal. These tanks are present at many treatment works and are used to store the large volumes of diluted sewage produced during high rainfall. Approval from the sewerage company must be sought before diverting pollutants to a sewage treatment works because the treatment process can be affected if levels of pollution are too high. This would result in the release of both

pollutants and untreated or partially treated sewage. See Section 1.66, [Environmental Protection Handbook](#).

Pollution control devices such as drain closure valves, storage lagoons or balancing ponds are installed in some surface water drainage systems. These devices can be used to help contain pollutants if permission is given by the sewerage company, the owner/occupier or highway authority. In some places the environment agencies keep large volume pumps that can be used to support, supplement or replace fire and rescue service pumps.

Unless there is an immediate risk to life, containment measures can be used and advice and guidance from environment agencies should be sought before making any attempt to dilute. Never add detergent or any other cleaning products to spillages and never hose spillages to the drain without prior authority from the environment agencies and/or sewerage undertakers.

For further information see the [Environmental Protection Handbook](#).

Strategic actions

Fire and rescue services should:

- Develop procedures for containing fire water run-off
- Obtain sewerage information from local sewerage undertaker
- Consider the inclusion of drainage information in operational risk plans. See National Operational Guidance: [Operations](#)

Tactical actions

Incident commanders should:

- Minimise the impact of the incident and fire service actions on any identified environmental risk
- Consider the legal exemptions in relation to environmental protection i.e.
 - A discharge is made in an emergency to avoid danger to human health
 - All reasonably practicable steps were taken to minimise pollution
 - The relevant environment agency is informed of the incident as soon as possible
- Consider carrying out an [environmental risk assessment](#) to identify:
 - Site drainage



- local surface waters and/or groundwater and vulnerability
- Attempt to control pollution using a Source – Pathway - Receptor model
- Consider the availability of pollution control equipment and/or pollution containment facilities on site
- Establish the location of the nearest sewage treatment works, and whether it has the capacity to contain and or treat fire water run-off?
- Inform and/or seek advice from environment agencies and/or sewage undertakers where necessary
- Consider diverting water to holding areas or sacrificial areas that will not affect firefighting operations
- Identify potential drainage routes for fire water run-off and released vehicle content
- Consider future disposal options. Refer to section [Disposal](#)
- Identify the location of motorway pollution control devices (PCD) and operate as necessary
- Communicate any risk to the environment to those attending the incident and relevant agencies



Control measure - Dilution

Control measure knowledge

In certain situations the best way to deal with domestic quantities of spillage may be to dilute it with a large amount of water. High levels of dilution should ensure that pollutants have little impact on the environment. It is important to consider the pollutant type and quantity, and how sensitive

the receiving water is before doing this.

Approval should also be sought from the environment agency and sewerage company before diluting a spillage unless there is an immediate life risk. In such circumstances they must be informed as soon as is reasonably practicable. See Guideline notification criteria Appendix 4, [Environmental Protection Handbook](#)

Strategic actions

Fire and rescue services should:

- Ensure that fire and rescue service managers who are likely to be in command of an incident involving hazardous materials and/or environmental risk, or are likely to perform the specialist advisory role of hazardous materials advisor (HMA), receive specialist environmental training. This training should place emphasis on larger-scale incidents where there is significant environmental risk
- Consider mobilising or involving a Hazardous Materials Advisor (HMA) for any incident with the potential to pollute the environment, not only those incidents involving hazardous materials. See section 3.3, [Environmental Protection Handbook](#)
- Identify triggers where the local environment agency should be informed or where advice should be requested
- Secure access to more detailed advice from scientific advisers or from the CHEMSAFE service provided by the National Chemical Emergency Centre (NCEC)

Tactical actions

Incident commanders should:

- Contain the spill
- Seek guidance from environment agencies before any attempt at dilution
- Not flush spillages down drains without approval from:
 - The local environment agency
 - Sewerage company
- Ensure that if detergents or other chemicals are added to spillages to assist with clean up or treatment the resulting mixture is not to be flushed down drains



Control measure - Absorption

Control measure knowledge

Minor spillages can be contained using absorbent materials like pads, sheets and booms. Hazardous materials will retain their hazardous properties when absorbed and this must be considered when handling any absorbed material. Soil, sand and cement all have absorbent qualities and can also be used to create improvised containment barriers or bunds. Absorbent materials should not be used for larger spillages because of the amount of waste that will be created and the cost of disposing it.

Fire and rescue services will normally have the responsibility for disposing of waste they generate at incidents they attend.

Strategic actions

Fire and rescue services should:

- Identify arrangements for the disposal of contaminated absorbents where the responsibility for waste disposal cannot be identified
- Refer to control measure actions for disposal of contaminated firewater run off under [fire water run-off](#)

Tactical actions

Incident commanders should:

- Consider the appropriate type of absorbent to be used for the pollutants
- Consider the benefits of using absorbents against the cost of disposal
- Consider how contaminated absorbent materials will be disposed of in consultation with the relevant environment agency and responsible persons based on the "polluter pays" principle.
- Consider identifying who is responsible for the disposal. See [Disposal](#) section in [Fire water run-off](#)



Control measure - Transportation

Control measure knowledge

There are strict controls on transporting hazardous waste. Fire and rescue services do have dispensation in exceptional, life saving circumstances. See Section 3.10.3, [Environmental Protection Handbook](#).

Fire and rescue services are allowed to transport and store small quantities of non-hazardous waste from incidents.

Strategic actions

Fire and rescue services should:

- Be aware of their legal responsibilities and possible defences for the transportation of hazardous waste
- Develop procedures for the transportation and storage of small quantities of non-hazardous waste, which includes items such as disposable gloves or chemical protection suits. See Section 3.10.4, [Environmental Protection Handbook](#)

Tactical actions

Incident commanders should:

- Consider the legal exemptions. See [Environmental legislation](#)
- Ensure that in the event that emergency transportation of hazardous waste is required, the relevant environment agency is to be informed of the incident as soon as possible and is involved in the decision to transport hazardous waste
- Ensure that fire and rescue service procedures relating to management and transportation of small quantities of non-hazardous waste are followed



Control measure - Aeration

Control measure knowledge

Organic pollutants such as milk and sewage will remove oxygen from bodies of water. Environment agencies and some specialist contractors can use aeration units or chemical methods to raise oxygen levels. Pumping the affected water into the air through hose jets is less effective but is a technique that can be used by fire and rescue services.

Strategic actions

Fire and rescue services should:

- Identify activities that will and will not be carried out by fire and rescue service personnel and equipment

Tactical actions

Incident commanders should:

- Liaise with the local environment agency and, where appropriate, specialist advisers when aeration is to be used to reduce environmental damage.



Control measure - Treatment

Control measure knowledge

Treatment of pollution in a watercourse, for example using activated carbon, or hydrogen peroxide are specialised techniques employed by an environment agency or specialist contractor rather than fire and rescue service personnel. However fire and rescue services maybe asked to assist at incidents where such techniques are employed subject to local agreement.

Strategic actions

Fire and rescue services should:

- Identify activities that will and will not be carried out by fire and rescue service personnel and equipment

Tactical actions

Incident commanders should:

- Ensure that where fire and rescue service personnel or equipment are requested to assist with any form of treatment activity a close liaison with the local environment agency and, where appropriate, specialist advisers is maintained



Control measure - Disposal

Control measure knowledge

During the early stages of an incident when the fire service activities are more dynamic, it may not always be possible to contain fire water safely. In these circumstances use of the foul sewer should be considered for disposal. The flow rate should be controlled to avoid the foul sewer overflowing. Failure to control the flow could result in polluting water entering the water environment. See [Fire water run-off](#).

At some incidents, the foul sewage system may be the best disposal option. If this is the case, the sewerage company must be contacted. They will consider the request and take account of the likely impact if they do not approve the discharge. Agreement from the appropriate environment agency must be obtained before any release takes place. This can be obtained by telephone but must be applied for and confirmed in writing later. See Section 1.6.6, [Environmental Protection Handbook](#).

For further information see Section 3.10.3 [Environmental Protection Handbook](#): The movement of hazardous waste by the fire and rescue service in emergencies.

For further information see Section 3.2.8 [Environmental Protection Handbook](#).

Strategic actions

Fire and rescue services should:

- Be aware of their legal responsibilities and possible defences for the disposal of fire water under the [Environmental Permitting Regulations 2010](#) and [Environmental Damage \(Prevention and Remediation\) Regulations 2015 \(EDR 2015\)](#)
- Develop plans for the disposal of contaminated fire water run off which include plans for:
 - Use off-site storage within drainage infrastructure e.g. balancing ponds
 - Use of foul water drainage
 - Contingencies for where the responsibility for disposal cannot be identified

Tactical actions

Incident commanders should:

- Ensure that waste products created by the fire and rescue service are disposed of both legally and responsibly. The [Environmental Permitting \(England and Wales\) Regulations 2010 \(EPR 2010\)](#) provides two exceptions for the emergency disposal of contaminated fire water runoff where the primary focus of fire and rescue service actions is saving life:
 - Emergency discharge and subsequent contamination of the water environment
 - The removal of waste by a fire and rescue services using fire and rescue service equipment or vehicles
- Consider the legal exceptions. see [Environmental Legislation](#)
- Ensure that the relevant environment agency is informed of the incident as soon as possible and is be involved in the decision to discharge
- Inform sewerage undertakers if discharge is to foul the water sewerage system
- Identify if the responsibility for disposal of waste produced at an incident can be delegated to a third party based on location, material and quantities involved. Namely:
 - Local authority - Playing fields, public open spaces, beaches and some roads
 - Landowner or owner / occupier - Private property
 - Highways agency - (Road Service in Northern Ireland) - Major roads
- Identify if there are any alternative methods of disposal:

- Suitable site arrangements for a waste disposal
- Tankering away the contaminated water
- Identify potential drainage routes for fire water run-off and released vehicle content
- Ensure that waste products created by the fire and rescue service are disposed of legally and responsibly



Control measure - Decontamination

Control measure knowledge

Decontaminating equipment at the incident site will reduce the risk of spreading the contaminant. For low level contamination, equipment should be flushed with mains water. Run-off should be discharged to a foul sewer if approved by the sewerage company. For high level contamination, run-off water should be contained and removed by a registered waste carrier. It can be discharged into a foul sewer if approved by the sewerage company and environment agency.

Where decontamination of people or personal protective equipment is carried out in an emergency it is unlikely that any offence will be committed under the relevant legislation. This is not the case when decontaminating equipment, appliances and roadways. There is no legal defence if pollution is caused following decontamination of equipment or body bags. Where there is uncertainty, advice may be sought from:

- Environment agencies
- Hazardous materials adviser (or equivalent)
- Fire and rescue service high volume pump subject matter advisers
- The local sewerage company

Strategic actions

Fire and rescue services should:

- Be aware of their legal responsibilities and possible defences for decontamination of people, personal protective equipment and the difference in the legislation regarding the decontamination of equipment, appliances, body bags and washing down roadways. See



[Environmental legislation](#)

- Include environmental protection within decontamination procedures
- Where appropriate inform the local environment agency when fire service decontamination activities are in operation

Tactical actions

Incident commanders should:

- Consider the type of decontamination involved and whether it is necessary to contain the decontamination agents used.
- Consider where people are being decontaminated; public drinking water supplies must be protected from the effects of run-off. (Consider the deployment of additional environmental protection equipment)
- Consider informing the local environment agency where any form of decontamination is carried out



Hazard - Physical damage to the environment

Hazard Knowledge

Some areas of natural conservation are susceptible to the risk of physical environmental damage. Careful movement and deployment of resources, i.e. fire service vehicles and equipment will help to reduce the possibility of physical damage. However knowledge and identification of the most susceptible sites is the most important factor in reducing environmental damage in these areas.



Control measure - Defined paths and tracks

Control measure knowledge

Nature conservation sites often have defined paths and tracks that are usually located away from the protected areas most susceptible to physical environmental damage. If present, and once it has been established that they are suitable for fire service use including access for vehicles, these paths

and tracks should be used.

Strategic actions

Fire and rescue services should:

- ensure that the location of defined paths and tracks are included within any operational risk plans or maps

Tactical actions

Incident commanders should:

- Consider the least damaging routes to incidents
- Consider the least damaging routes to incidents and where possible, stay on marked paths and tracks
- Ensure that tracks and pathways are suitable for fire service vehicles
- Take care when deciding where to place equipment or tool dumps or siting control points
- Carry out an [environmental risk assessment](#)
- Establish 'exclusion zones' to protect sensitive assets that may be affected by firefighting



Control measure - Liaison with conservation bodies

Control measure knowledge

Areas of nature conservation (ANC) such as Sites of Special Scientific Interest (SSSI), Areas of Special Scientific Interest (ASSI) in Northern Ireland) are important sites designated and protected for being the best examples of their characteristic wildlife and geology. Staff and volunteers from relevant nature conservation bodies normally manage these sites.

Strategic actions

Fire and rescue services should:

- Be aware of their legal responsibilities under nature conservation legislation, which includes the [Environmental Damage \(Prevention and Remediation\) Regulations \(EDR\) 2009 for Wales and Scotland or equivalent in Northern Ireland](#)
- Seek advice from relevant nature conservation bodies relating to areas susceptible to physical damage

Tactical actions

Incident commanders should:

- Seek advice from landowners and other bodies on susceptible areas of the environment
- Implement an appropriate protection plan when an identified nature conservation site is at risk



Control measure - Operational risk information plan (Nature conservation sites)

Control measure knowledge

Although each nature conservation site will have its own environmental damage risks which can be captured with individual operational risk plans, a set of generic action plans will also help to identify generic environmental protection action to be taken in the early stages of an incident. See Section 2.6.5, [Environmental Protection Handbook](#).

Strategic actions

Fire and rescue services should:

- Consider introducing operational risk information plans with environmental risk notes for

sites of nature conservation that are more susceptible to environmental damage. Where appropriate these plans should include:

- Environmentally safe areas for deployments and movements of fire service resources
- Identification of areas that are susceptible to physical environmental damage

Tactical actions

All personnel should:

- Ensure that all relevant incident information is relayed to the incident commander



Hazard - Leaks from high pressure oil pipelines

Hazard Knowledge

A network of high-pressure oil pipelines exists in most parts of the UK. The pipelines transport flammable liquids, including petrol, diesel, aviation fuel and oil. At any one time several liquids may be in a pipeline. Should a leak or breach occur then two or three different liquids could be released.

Pipelines are typically 100 - 400 mm diameter steel pipes, laid in 1.5 m deep excavations. Marker posts normally identify the pipeline route. Excavations, landslips, flooding, pipeline corrosion and operational errors may compromise the integrity of a pipeline. Should a break occur, up to two million litres of product could be released over a 30-minute period, resulting in a significant environmental emergency. See Section 2.7, [Environmental Protection Handbook](#).

Pollution from high pressure pipe lines can occur from:

- Mechanical failure of pipeline plant
- Accidental pipe line strike
- Illegal activity (pipe tapping)

The response and tactics used will depend on the incident, its location and resource availability. Any incident is likely to be declared a major incident because of the large quantities of highly flammable product released. Incident commanders may consider the following actions:

- Blanketing pollutant with firefighting foam to reduce vapour and ignition risks.
- Providing resources to protect drinking water supplies, important wildlife habitats and sewer systems.



The pipeline operator should be contacted immediately to find out if the affected section is being isolated.

See Section 2.7, [Environmental Protection Handbook](#).



Control measure - Containment

Control measure knowledge

The principle of containment whenever practicable and safe to do so is the preferred approach to managing incidents where polluting liquids or materials have been released or generated by on-site activities, including firefighting.

This hierarchy should be used in most instances when containing contaminated fire water run-off and spillages of polluting materials:

Hierarchy	Activity	Description
1	Containment at source	The most effective intervention point is where the source of pollution can be controlled to stop or reduce the volume released. Methods include the use of clay seal putty, leak sealing devices, wedges, and drums. Contaminated fire water will ideally be contained at an incident scene either inside the building or as close to it as possible.
2	Containment close to source	The next point of intervention is as close to the source as possible. This may be when it is not possible to contain at source or where there has already been significant loss of pollutant. Methods include the use of grab packs, booms and pop-up pools.
3	Containment on the surface	The most common way for contaminants to enter the environment is via drainage systems. Methods to prevent this include the use of booms, clay drain mats, pipe blockers, pumps, and inflatable dams.

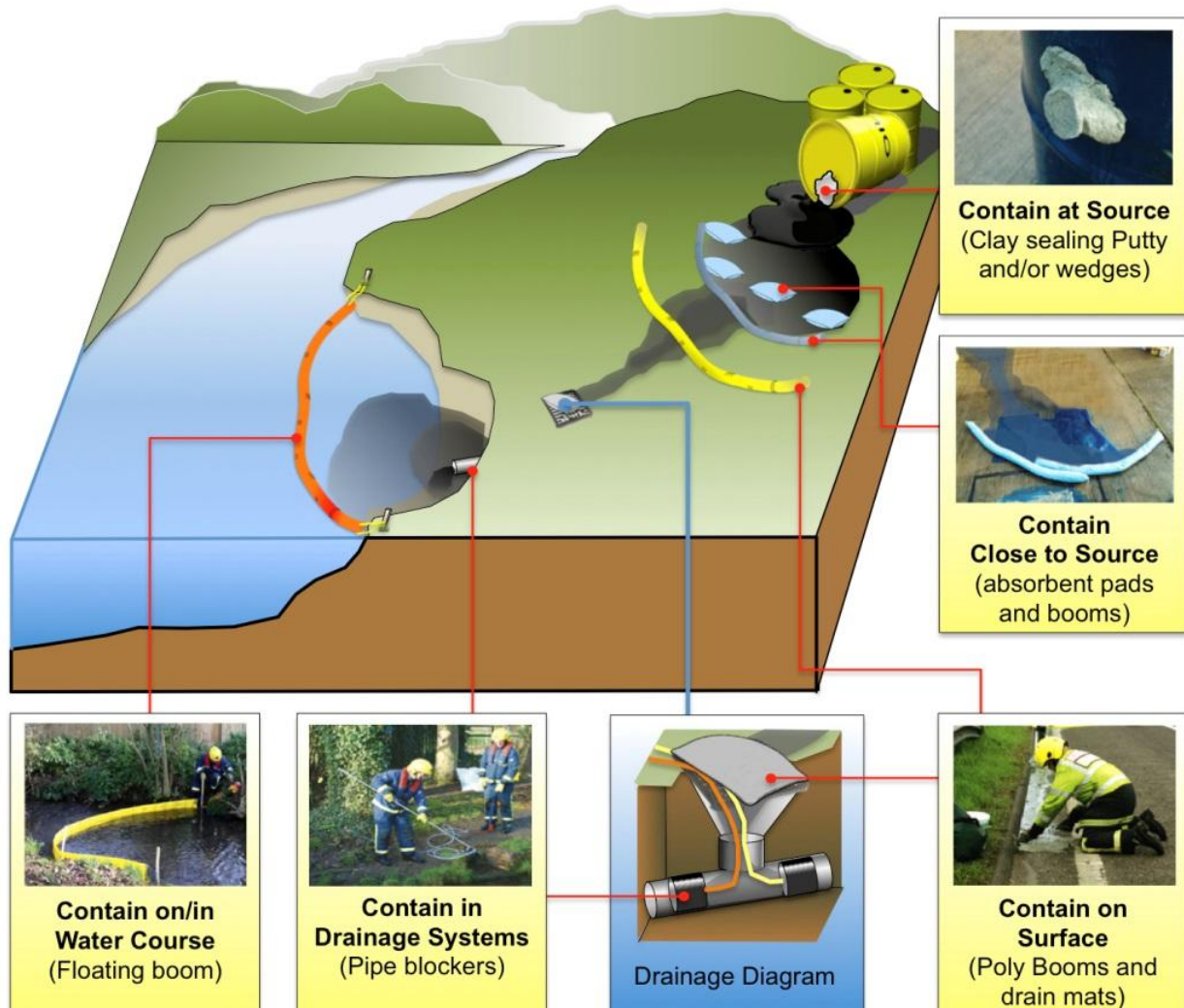


- | | | |
|---|----------------------------------|--|
| 4 | Containment in drainage system | Pollutants may be contained in drainage systems if they have already entered the system. This can be carried out using in-built pollution control devices in the drainage systems such as oil separators, drain closure valves and containment lagoons/tanks and ponds. Such a system should allow predictable volumes of run-off to be stored, although allowance should be made for rainfall and how well systems have been maintained. Portable equipment such as pipe blockers can also be used. |
| 5 | Containment on or in watercourse | The deployment of booms on a watercourse downstream of an incident is of significant benefit where a pollutant floats. Damming can be used where pollutants are mixed or do not float but is normally restricted to small ditches and streams with low flows. Booms can also be deployed around drinking water intakes. |

See Section 3.2, [Environmental Protection Handbook](#).



Pollution Hierarchy



Off-site containment is an alternative that can be considered by fire and rescue services. Foul sewerage systems can be used to contain polluting material if approved by the sewerage company and environment agency. When doing so take care that pollutants and sewage do not escape from any storm overflows into the sewerage system. The contained pollutants and sewage may then be removed.

It may also be possible to divert pollutants to a local sewage treatment works, where the pollutant can either be treated in the treatment process or contained in storm tanks before deciding on disposal. These tanks are present at many treatment works and are used to store the large volumes of diluted sewage produced during high rainfall. Approval from the sewerage company must be sought before diverting pollutants to a sewage treatment works because the treatment process can be affected if levels of pollution are too high. This would result in the release of both

pollutants and untreated or partially treated sewage. See Section 1.66, [Environmental Protection Handbook](#).

Pollution control devices such as drain closure valves, storage lagoons or balancing ponds are installed in some surface water drainage systems. These devices can be used to help contain pollutants if permission is given by the sewerage company, the owner/occupier or highway authority. In some places the environment agencies keep large volume pumps that can be used to support, supplement or replace fire and rescue service pumps.

Unless there is an immediate risk to life, containment measures can be used and advice and guidance from environment agencies should be sought before making any attempt to dilute. Never add detergent or any other cleaning products to spillages and never hose spillages to the drain without prior authority from the environment agencies and/or sewerage undertakers.

For further information see the [Environmental Protection Handbook](#).

Strategic actions

Fire and rescue services should:

- Develop procedures for containing fire water run-off
- Obtain sewerage information from local sewerage undertaker
- Consider the inclusion of drainage information in operational risk plans. See National Operational Guidance: [Operations](#)

Tactical actions

Incident commanders should:

- Minimise the impact of the incident and fire service actions on any identified environmental risk
- Consider the legal exemptions in relation to environmental protection i.e.
 - A discharge is made in an emergency to avoid danger to human health
 - All reasonably practicable steps were taken to minimise pollution
 - The relevant environment agency is informed of the incident as soon as possible
- Consider carrying out an [environmental risk assessment](#) to identify:
 - Site drainage



- local surface waters and/or groundwater and vulnerability
- Attempt to control pollution using a Source – Pathway - Receptor model
- Consider the availability of pollution control equipment and/or pollution containment facilities on site
- Establish the location of the nearest sewage treatment works, and whether it has the capacity to contain and or treat fire water run-off?
- Inform and/or seek advice from environment agencies and/or sewage undertakers where necessary
- Consider diverting water to holding areas or sacrificial areas that will not affect firefighting operations
- Identify potential drainage routes for fire water run-off and released vehicle content
- Consider future disposal options. Refer to section [Disposal](#)
- Identify the location of motorway pollution control devices (PCD) and operate as necessary
- Communicate any risk to the environment to those attending the incident and relevant agencies



Control measure - Diversion

Control measure knowledge

In some cases, pollutants can be diverted to areas that are considered to be of less environmental value or having less risk (called 'sacrificial' areas). For example, low-lying areas such as roadways can be used. This strategy must be agreed with the appropriate environment agency, highways

authority, and other relevant parties.

Strategic actions

Fire and rescue services should:

- Identify if high pressure pipelines traverse their area of response
- Where appropriate, have multi-agency emergency plans, procedures and equipment in place for dealing with high pressure oil pipeline incidents which include guidance relating to the diversion of oil

Tactical actions

Incident commanders should:

- Inform, or request the attendance of, the relevant environment agency and any other appropriate agencies:
 - Pipeline operator
 - Nature conservation bodies
 - Public Health organisations
 - Local authority
 - Highway agencies
 - Other relevant parties including police, landowners and marine agencies
- Identify sacrificial areas where products can be diverted
- Ensure water companies and other water abstractors are aware of threats to drinking water and other abstractions, which can be achieved via environment agency



Control measure - Operational risk information plan

Control measure knowledge

Operational risk information plans are prepared in accordance with the [Fire and Rescue Services](#)



[Act 2004](#) and focus on firefighter safety. The plans should also include information on pollution, prevention and control where a risk to the environment is identified at an incident.

For further information see:

- [DCLG operational risk information guidance](#)
- Section 2.2 and 2.3, [Environmental Protection Handbook](#)
- National Operational Guidance: Operations [Identify foreseeable risk](#)
- National Operational Guidance: [Incident Command](#)

Strategic actions

Fire and rescue services should:

- Include environmental risk information within operational risk plans

Tactical actions

Incident commanders should:

- Consider pollution prevention information contained within site specific risk plans
- Carry out an [environmental risk assessment](#)
- Implement the environmental protection measures identified in operational risk information
- Monitor the impact of fire and rescue service tactics on the identified environmental risk
- Identify operation and effectiveness of fixed installations and pollution prevention measures